

## DELTA PROTECTION COMMISSION

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To: Delta Protection Commission

From: Margit Aramburu, Executive Director

Subject: Delta In-Channel Islands  
(For Commission Information Only)

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**REASON FOR THE BRIEFING:**

Staff has been attending San Francisco Estuary Project (SFEP) working group meetings on the topic of Delta in-channel islands. The first was an all-day workshop covering all aspects of in-channel islands. The follow-up sessions have been attended by representatives of state and federal agencies, technical experts, academics, boating representatives, land owners and other interested parties meeting as in informal work group. The participants are interested in pursuing consensus on technical and regulatory issues with the goal of protecting and enhancing the remaining in-channel islands. The group is coordinating with CALFED.

**BACKGROUND OF IN-CHANNEL ISLANDS:**

Pre-1850, the Delta was an extensive marshy area, crossed by waterways. Along the channels were low, natural levees of mineral material created by deposition of floodwaters in times of high water flow. The earliest reclamation efforts--from the early 1850's to the early 1880's--were by hand. Hundreds of Chinese laborers, unemployed after the Transcontinental Railroad was completed, built low levees atop the natural levees using little more than wheelbarrows. Reclamation with these techniques was focused on the higher elevation areas on the periphery of the Delta.

After the invention of the clamshell dredge in 1879, reclamation moved toward the central peat islands. The clamshell dredge was on a barge with a long boom. The buckets scooped materials from the low-lying edges of the islands, placing the dredged material atop the islands to create levees along the water channels. The Delta in-channel

islands are remnants of the original islands left along new channels created by the clamshell dredges. In addition, some in-channel islands were created when levees were created in the middle of reclaimed islands. The reclamation of the Delta by clamshell dredge was completed by the start of World War II.

#### PHYSICAL CHARACTERISTICS OF IN-CHANNEL ISLANDS:

The physical characteristics of the in-channel islands vary within the Delta. There has been no comprehensive inventory of the islands. However, as the channel beds vary, so do the channel islands. The islands are made up of varying percentages of mineral soils (sand and clay) and organic peat soils.

Historically, channel islands were used as sources of material for levee repair, particularly emergency levee repair. This practice stopped in the late 1950's.

The distribution of in-channel islands is not even. There are many in the central Delta; there are some in the north and some in the south.

#### VEGETATIVE CHARACTERISTICS OF IN-CHANNEL ISLANDS:

Like the physical characteristics, these vary greatly. Some of the larger islands support trees (e.g. Sycamore Island which is a heron rookery); most support tules; some are just a fringe of tules. There are endangered plants on many islands, such as Delta tule pea and Mason's *Lilaeopsis*.

#### OWNERSHIP ISSUES:

The channel islands are shown on Delta parcel maps; the private landowners are charged taxes on the channel islands along with all other property. The State Lands Commission has expressed possible property interest over in-channel islands, but has never interfered with efforts to protect and restore the in-channel islands for their habitat values. SLC has "agreed to disagree" about ownership in these situations.

#### WHAT IS THE CONCERN ABOUT THE IN-CHANNEL ISLANDS?

The channel islands are disappearing, and along with them, unique Delta habitat areas. State Lands Commission staff research on old and current aerial photographs illustrate this "shrinkage" (see Exhibit A). Landowners recite stories of islands and waterside berms that have just plain eroded away.

There are many causes of erosion, some natural and some not. Erosion occurs at different rates and in different ways depending on the individual situation. Natural causes include: high water from winter storm runoff; the twice daily tidal cycle; wind-created waves; and burrowing by aquatic mammals. Non-natural causes include: unseasonable high water due to upstream releases from dams and reservoirs; boat wakes; diversion of large amounts of water into certain channels as part of the water projects; and construction of new water control elements, such as the cross-channel.

In addition, sediment movement in the Delta watershed has been modified. The Delta was inundated with mineral material when Placer mining moved huge volumes of material into the Delta; experts say the last of that material passed through the Delta before 1970. Upstream dams now capture sediments that would otherwise enter the Delta. Some landowners say large amounts of sediment are deposited during extreme conditions, such as 1986 when there was flooding in the Delta.

#### WHAT HAS BEEN DONE TO PROTECT THE IN-CHANNEL ISLANDS?

Several experiments have been performed in the last few years to control erosion of the in-channel islands and to create new areas for riparian habitats. Many of these projects have been on or around Staten Island, San Joaquin County, some on in-channel islands and some along the waterside base of the levees. Funds for some of the projects were provided by M&T Ranch; other funds have been provided by the State of California as part of a program to mitigate for past losses of "shaded riverine aquatic" habitat associated with levee maintenance work.

The following is a brief summary of some of the experiments. All of the projects described below were constructed with the assistance of M&T Staten Ranch, along the South Fork of the Mokelumne River, in San Joaquin County:

1992: Riprap walls were constructed about 10 to 20 feet from the waterside toe of the levee, along approximately 1,500 lineal feet of the levee. Dredged materials from the adjacent channel were placed behind the riprap to create new areas for plant growth. Portions of the rock dikes had filter fabric placed on the interior wall and in other locations, there was no filter fabric. Cuttings were planted in the dredged fill material. This project combined levee protection and wildlife enhancement.

1993: Four different low-cost techniques were used to protect the levees and to create wildlife habitat:

(1) At four locations, riprap dikes were constructed parallel to the shoreline to create a new waterside berm. Dredged material was placed next to and behind the dikes. At some of the sites root wads were placed in the riprap to enhance underwater habitat.

(2) At the entrance to a lagoon where woody vegetation was being undermined by erosion and along an eroding beach 60 to 80 feet long, riprap was placed atop filter fabric.

(3) At several sites, GEOWEB polyethylene cellular confinement material was installed, using slightly different techniques, to evaluate the material.

(4) Logs and root wads were placed between an island and the adjacent levee to control erosion and while allowing flows through a shallow lagoon.

1994: (1) At Sycamore Island, a 600 feet wide by 1,100 feet long island, vertical pilings and floating log booms were installed to "still" waves eroding parts of the island. The island is used as a heron rookery.

(2) This project protected three channel islands: one is 2,650 feet long by 40 feet wide; one is 1,960 feet long by 15 feet long; and one is 1,100 feet long by 30 feet wide. At each island, riprap was placed along the deep channel edge of the islands and area for new habitat was created by placing dredged material on the inland side of the riprap over filter fabric. Cuttings were placed in the dredged material. In addition, wire "beaver cages" were placed around the tree cuttings to protect them from beavers. No riprap was placed on the levee side of the islands. However, vertical pilings were installed between the in-channel islands and the main levee to slow boat traffic in that area.

#### WHAT IS NEXT?

There are several programs underway and under development that are developing programs to protect and/or enhance Delta in-channel islands.

The Department of Fish and Game has responsibility for providing mitigation for past adverse environmental impacts associated with levee maintenance. This program has created new habitat at several locations. Some of the funding available for this mitigation program has not yet been expended; several projects are under consideration.

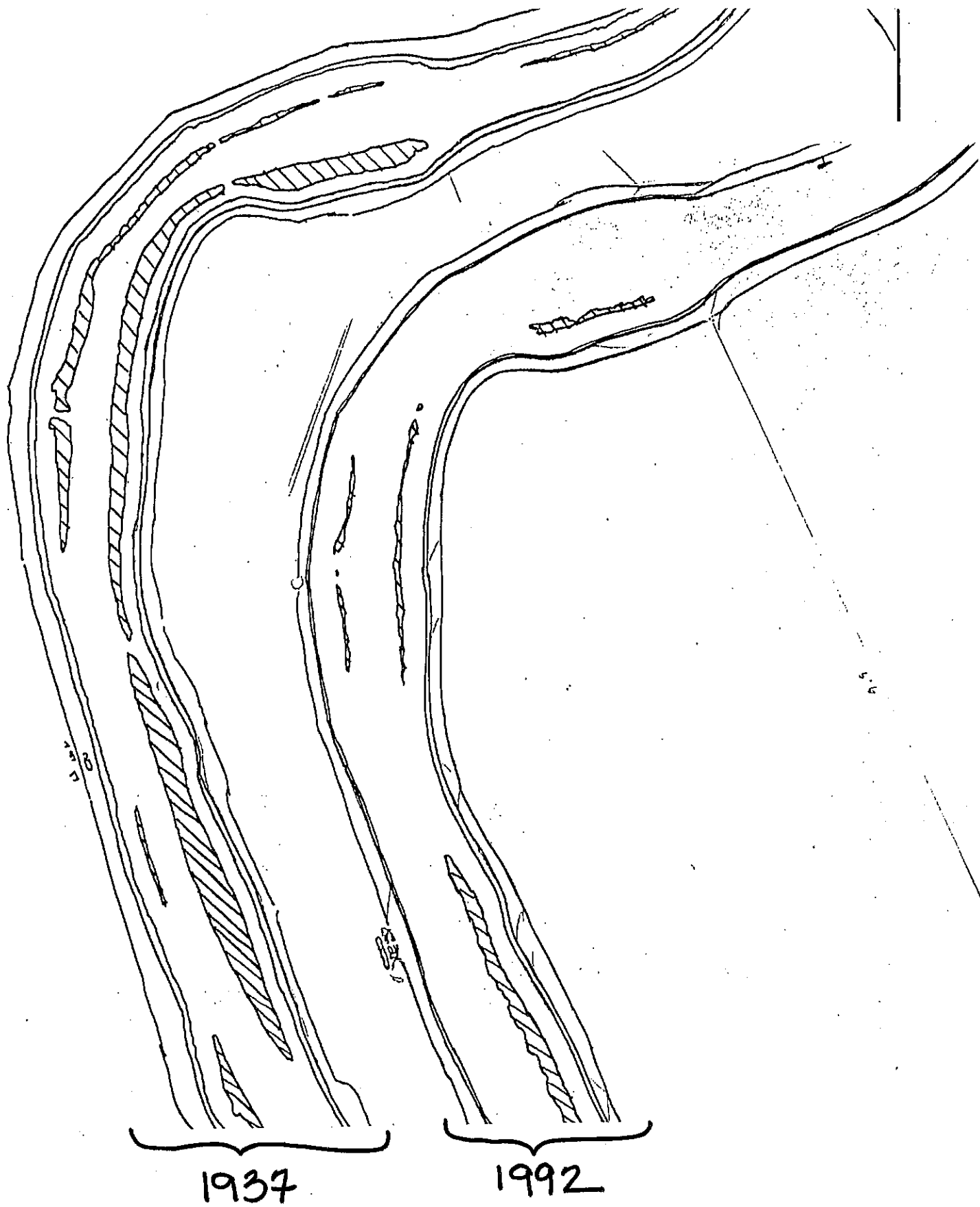
The CALFED program (April 15, 1996 Draft Ten Alternatives) includes "Protect and enhance 500 to 1,000 acres of existing riverine habitat at the highest priority, most cost-effective sites on channel islands."

The SFEP Work Group is attempting to develop scientific information about the location, characteristics, and vulnerability of the in-channel islands, and to develop consensus on the techniques which are acceptable to use in various situations to control erosion of in-channel islands.

The SFEP Work Group may/will eventually become a part of the CALFED process; there will not be duplication of effort between the two programs. There is and will continue to be coordination between the programs.

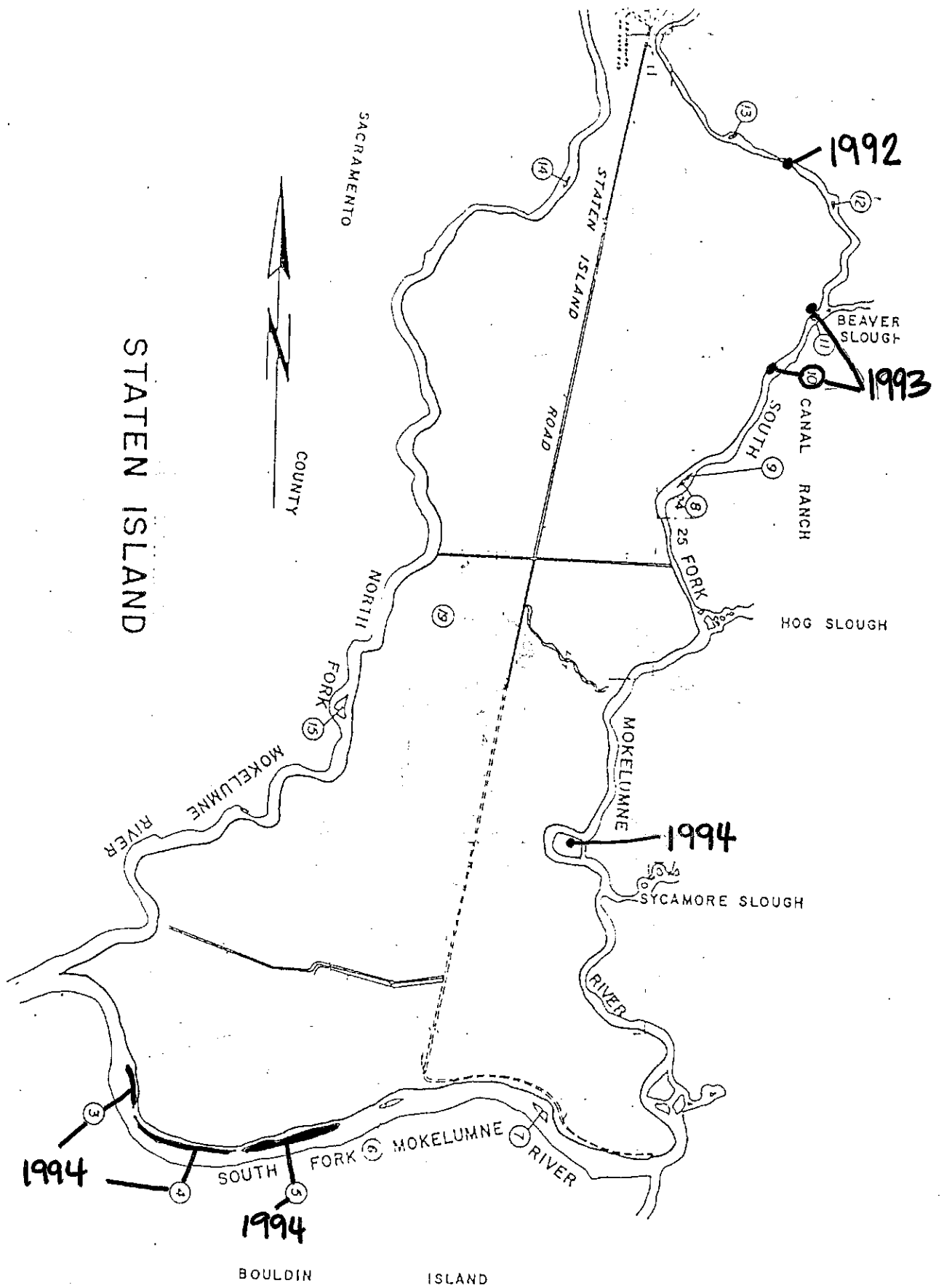
The SFEP Work Group has developed a draft "Framework Agreement" which is being reviewed by key agencies as a tool to build support and consensus for the SFEP program. If approved by the key agencies, the Framework Agreement will be forwarded to the Commission for consideration and possible approval.





Comparison of Aerial Photos





ISLAND/BERM PROJECTS

Exhibit B